INEEL OU 1-10 Site TSF-09, Tank V-2
Preliminary Liquid Phase Chemical Characterization Summary

- The liquid phase of the waste associated with this tank is considered a wastewater for purposes of complying with the Land Disposal Restrictions, in that it contains <1% TOC and <1% TSS. This determination as well as the hazardous waste determination listed below is preliminary based on existing analytical data.

- **Hazardous Waste Determination:** Highest concentrations detected in the waste are reported.

The RCRA Waste codes that apply to this waste are as follows:

Constituent	Concentration Detected in Waste (mg/L)	Regulatory Limit (mg/L)	Applicable Waste Code	LDR Treatment Standard for wastewater (mg/L)
2,4-Dinitrotoluene	ND @ 1	0.13	D030	0.32
Hexachlorobenzene	ND @ 1	0.13	D032	0.055
Hexachlorobutadiene	ND @ 1	0.5	D033	0.055
Trans-1,2-Dichloro-ethene	0.37	0.054	UHC	0.054
Trichloroethene	0.3 E J	0.5 mg/L as D040, None if F-listed, or 0.054 as a UHC	F001	0.054

Note: SVOCs are also identified to be present as UHCs. See write-up below.

- **UHC** = Underlying Hazardous Constituent
  E = Exceeded calibration limit for instrument.
  J = Estimated Value
  ND = Not Detected

- Based on a review of the inorganic analysis, antimony is the only constituent rejected during data validation and determined to be unusable. Since the rejected value is below the underlying hazardous constituent concentration, it is listed here for informational purposes.
- Based on a review of the volatile organic analysis, chloromethane is the only constituent rejected during data validation and determined to be unusable. Since the rejected value is below the underlying hazardous constituent concentration, it is listed here for informational purposes
- The detection limits for a majority of the SVOCs, except for bis(2-ethylhexyl) phthalate and pyrene, were above the wastewater treatment standards. However, since this waste Will not be re-analyzed, the following SVOCs are also assumed to be present at the detection limit value (See attached tables for concentration) and are

identified as UHCs: Acenaphthene, Acenaphthylene, Anthracene, Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(g,h,I)perylene, Benzo(k)fluoranthene, Butylbenzylphthalate, Bis (2-chloroethoxy) methane, Bis (2-chloroethyl) ether, Bis (2-chloroisopropyl) ether, 4-Bromophenyl-phenylether, Chrysene, 4-Chloroaniline, 4-Chloro-3-Methylphenol, 2-Chloronaphthalene, 2-Chlorophenol, Dibenz(a,h)anthracene, 1,2-Dichlorobenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 3,3-Dichlorobenzidine, 2,4-Dichlorophenol, Diethylphthalate, 2,4-Dimethylphthalate, Dimethylphthalate, Di-n-butylphthalate, Di-n-octylphthalate, 2,4-Dinitrophenol, 2,6-Dinitrotoluene, Fluoranthene, Fluorene, Hexachlorocyclopentadiene, Hexachloroethane, Indeno(1,2,3-cd) pyrene, 2-Methylphenol, 4-Methylphenol, Napthalene, 2-Nitroaniline, 4-Nitroaniline, Nitrobenzene, 2-Nitrophenol, 4-Nitrophenol, N-nitroso-dimethylamine, N-nitroso-di-n-propylamine, N-nitrosodiphenylamine, Pentachlorophenol, Phenanthrene, Phenol, Pyrene, Pyridine, 1,2,4-Trichlorobenzene, 2,4,5-Trichlorophenol, and2,4,6-Trichlorophenol..Three of the SVOC constituents (2,4-Dinitrotoluene, Hexachlorobenzene, and Hexachlorobutadiene) also had detection limit above the toxicity characteristic levels. LDR guidance suggests that in cases where detection limits are above either the characteristic limit or treatment standards, the generator may use his knowledge of the waste, in lieu of analytical results, to certify that the constituent(s) are not present in the waste. However, this waste will not be re-analyzed for 2,4-Dinitrotoluene, Hexachlorobenzene, and Hexachlorobutadieneand it is assumed that these constituents are present at the detection limit value (as identified above).

- Based on a review of the analytical data provided by INEEL, this waste is considered a hazardous waste based on the presence of Trichloroethene as an F-listed constituent, and characteristic, which must be treatment to meet the land disposal restrictions.

- **Recommendation:**

  If this waste will not be treated on-site, the waste acceptance criteria of possible off-site treatment facilities should also be considered.

INEEL V-2 Liquids, VOC Analysis

Constituents	Concentration mg/L	Applicable Regulatory Limit	Applicable RCRA Waste Code	LDR Treatment Standard for wastewater in mg/l	LDR Treatment Standard for non-wastewater in mg/kg	Comments
Acetone	U (0.01) J	Treatment standard limit if UHC	UHC	0.28	160	
Benzene	U (0.01) J	0.5 mg/l (D018) or treatment standard limit if UHC	D018 or UHC	0.14	10	
Bromodichloromethane	U (0.01) J	Treatment standard limit if UHC	UHC	0.35	15	
Bromoform (Tribromomethane)	U (0.01) J	Treatment standard limit if UHC	UHC	0.63	15	
Bromomethane	U (0.01) J	Treatment standard limit if UHC	UHC	0.11	15	
2-Butanone (MEK)	U (0.01) J	200 mg/l (D035) or treatment standard limit if UHC	D035 or UHC	0.28	36	
Carbon disulfide	U (0.01) J	Treatment standard limit if UHC	UHC	3.8	4.8 mg/l	
Carbon tetrachloride	U (0.01) J	Treatment standard limit if UHC	UHC	0.057	6	

U = Not Detected (Detection limit in parenthesis).
J = Estimated Value
R = Result rejected during validation and unusable.
E = Exceeded calibration range of instrument.

INEEL V-2 Liquids, VOC Analysis

Constituents	Concentration mg/L	Applicable Regulatory Limit	Applicable RCRA Waste Code	LDR Treatment Standard for wastewater in mg/l	LDR Treatment Standard for non-wastewater in mg/kg	Comments
Chlorobenzene	U (0.01) J	100 mg/l (D021) or treatment standard limit if UHC	D021 or UHC	0.057	6	
Chloroethane	U (0.01) J	Treatment standard limit if UHC	UHC	0.27	6	
Chloroform	U (0.01) J	6 mg/l (D022) or treatment standard limit if UHC	D022 or UHC	0.046	6	
Chloromethane	0.01 R	Treatment standard limit if UHC	UHC	0.19	30	Since this value was rejected, it will have to be re-analyzed to determine concentration in the waste.
Dibromochloromethane (Chlorodibromomethane)	U (0.01) J	Treatment standard limit if UHC	UHC	0.057	15	
1,1-Dichloroethane	0.036 J	Treatment standard limit if UHC	UHC	0.059	6	
1,2-Dichloroethane	U (0.01) J	0.5 mg/l (D028), or treatment standard limit if UHC	D028 or UHC	0.21	6	

U = Not Detected (Detection limit in parenthesis).
J = Estimated Value
R = Result rejected during validation and unusable.
E = Exceeded calibration range of instrument.

49,171.72

INEEL V-2 Liquids, VOC Analysis

Constituents	Concentration mg/L	Applicable Regulatory Limit	Applicable RCRA Waste Code	LDR Treatment Standard for wastewater in mg/l	LDR Treatment Standard for non-wastewater in mg/kg	Comments
1,1-Dichloroethene	U (0.01) J	0.7 mg/l (D029) or treatment standard limit if UHC	D029 or UHC	0.025	6	
trans-1,2-Dichloroethene	**0.37 EJ**	**Treatment standard limit if UHC**	**UHC**	**0.054**	**30**	**The 0.37 mg/L concentration exceeds the ww treatment standards and is therefore a UHC.**
1,2-Dichloropropane	U (0.01) J	Treatment standard limit if UHC	UHC	0.85	18	
cis-1,3-Dichloropropene	U (0.01) J	Treatment standard limit if UHC	UHC	0.036	18	
trans-1,3-Dichloropropene	U (0.01) J	Treatment standard limit if UHC	UHC	0.036	18	
Ethylbenzene	U (0.01) J	Treatment standard limit if UHC	UHC	0.057	10	
2-Hexanone (Methyl n-butyl ketone)	U (0.01) J	NA	NA	NA	NA	
4-Methyl-2-pentanone (MIK)	U (0.01) J	Treatment standard limit if UHC	UHC	0.14	33	
Methylene chloride	U (0.01) J	Treatment standard limit if UHC	UHC	0.089	30	

U = Not Detected (Detection limit in parenthesis).
J = Estimated Value
R = Result rejected during validation and unusable.
E = Exceeded calibration range of instrument.

50 of 172

INEEL V-2 Liquids, VOC Analysis

Constituents	Concentration mg/L	Applicable Regulatory Limit	Applicable RCRA Waste Code	LDR Treatment Standard for wastewater in mg/l	LDR Treatment Standard for non-wastewater in mg/kg	Comments
Styrene	U (0.01) J	NA	NA	NA	NA	
1,1,2,2-Tetrachloroethane	U (0.01) J	Treatment standard limit if UHC	UHC	0.057	6	
Tetrachloroethene	U (0.01) J	0.7 mg/l (D039) or treatment standard limit if UHC	D039 or UHC	0.056	6	
Toluene	U (0.01) J	Treatment standard limit if UHC	UHC	0.08	10	
1,1,1-Trichloroethane	U (0.01) J	Treatment standard limit if UHC	UHC	0.054	6	
1,1,2-Trichloroethane	U (0.01) J	Treatment standard limit if UHC	UHC	0.054	6	
Trichloroethene	**0.3 E J**	**None if listed**	**F001**	**0.054**	**6**	**0.3 mg/L is below the characteristic limit, but exceeds the wastewater treatment standard. Therefore it is a UHC.**
Vinyl chloride	0.02	0.2 mg/l (D043), orTreatment standard limit if UHC	D043 or UHC	0.27	6	
Xylene (ortho)	U (0.01) J	NA	NA	NA	NA	

U = Not Detected (Detection limit in parenthesis).
J = Estimated Value
R = Result rejected during validation and unusable.
E = Exceeded calibration range of instrument.

INEEL V-2 Liquids, VOC Analysis

Constituents	Concentration mg/L	Applicable Regulatory Limit	Applicable RCRA Waste Code	LDR Treatment Standard for wastewater in mg/l	LDR Treatment Standard for non-wastewater in mg/kg	Comments
Xylene (total meta and para)	U (0.01) J	Treatment standard limit if UHC	UHC	0.32	30	

U = Not Detected (Detection limit in parenthesis).
J = Estimated Value
R = Result rejected during validation and unusable.
E = Exceeded calibration range of instrument.

INEEL V-2 Liquids, SVOC Analysis

Constituents	Concentration mg/L	Applicable Regulatory Limit	Applicable RCRA Waste Code	LDR Treatment Standard for wastewater in mg/l	LDR Treatment Standard for non-wastewater in mg/kg	Comments
Acenaphthene	U (1)	UHC Treatment Standard	UHC	0.059	3.4	1 mg/L detection limits exceed the wastewater treatment standard.
Acenaphthylene	U (1)	UHC Treatment Standard	UHC	0.059	3.4	1 mg/L detection limits exceed the wastewater treatment standard.
Anthracene	U (1)	UHC Treatment Standard	UHC	0.059	3.4	1 mg/L detection limits exceed the wastewater treatment standard.
Benzo (a) anthracene	U (1)	UHC Treatment Standard	UHC	0.059	3.4	1 mg/L detection limits exceed the wastewater treatment standard.
Benzo (a) pyrene	U (1)	UHC Treatment Standard	UHC	0.061	3.4	1 mg/L detection limits exceed the wastewater treatment standard.
Benzo (b) fluoranthene	U (1)	UHC Treatment Standard	UHC	0.11	6.8	1 mg/L detection limits exceed the wastewater treatment standard.
Benzo (g,h,I) perylene	U (1)	UHC Treatment Standard	UHC	0.0055	1.8	1 mg/L detection limits exceed the wastewater treatment standard.
Benzo (k) fluoranthene	U (1)	UHC Treatment Standard	UHC	0.11	6.8	1 mg/L detection limits exceed the wastewater treatment standard.
Benzoic acid	U (1)	None	NA	NA	NA	
Benzyl alcohol	U (1)	None	NA	NA	NA	
Butylbenzylphthalate	U (1)	UHC Treatment Standard	UHC	0.017	28	1 mg/L detection limits exceed the wastewater treatment standard.
Bis (2-chloroethoxy)methane	U (1)	UHC Treatment Standard	UHC	0.036	7.2	1 mg/L detection limits exceed the wastewater treatment standard.
Bis (2-chloroethyl)ether	U (1)	UHC Treatment Standard	UHC	0.033	6	1 mg/L detection limits exceed the wastewater treatment standard.
Bis (2-chloroisopropyl) ether	U (1)	UHC Treatment Standard	UHC	0.055	7.2	1 mg/L detection limits exceed the wastewater treatment standard.

U = Not Detected (Detection limit in parenthesis).
J = Estimated Value

53 of 172

INEEL V-2 Liquids, SVOC Analysis

Constituents	Concentration mg/L	Applicable Regulatory Limit	Applicable RCRA Waste Code	LDR Treatment Standard for wastewater in mg/l	LDR Treatment Standard for non-wastewater in mg/kg	Comments
Bis (2-ethylhexyl) phthalate	0.2 J	UHC Treatment Standard	UHC	0.28	28	Concentration is below both treatment standards, therefore it is not a UHC.
4-Bromophenyl-phenylether	U (1)	UHC Treatment Standard	UHC	0.055	15	1 mg/L detection limits exceed the wastewater treatment standard.
Carbozole (or Carbazole)	U (1)	None	NA	NA	NA	
Chrysene	U (1)	UHC Treatment Standard	UHC	0.059	3.4	1 mg/L detection limits exceed the wastewater treatment standard.
4-Chloroaniline (p-chloroaniline)	U (1)	UHC Treatment Standard	UHC	0.46	16	1 mg/L detection limits exceed the wastewater treatment standard.
4-Chloro-3-Methylphenol (p-chloro-m-cresol)	U (1)	UHC Treatment Standard	UHC	0.018	14	1 mg/L detection limits exceed the wastewater treatment standard.
2-Chloronaphthalene	U (1)	UHC Treatment Standard	UHC	0.055	5.6	1 mg/L detection limits exceed the wastewater treatment standard.
4-Chlorophenyl-phenylether	U (1)	None	NA	NA	NA	
2-Chlorophenol	U (1)	UHC Treatment Standard	UHC	0.044	5.7	1 mg/L detection limits exceed the wastewater treatment standard.
Dibenz(a,h)anthracene	U (1)	UHC Treatment Standard	UHC	0.055	8.2	1 mg/L detection limits exceed the wastewater treatment standard.
Dibenzofuran	U (1)	None	NA	NA	NA	
1,2-Dichlorobenzene (o-dichlorobenzene)	U (1)	UHC Treatment Standard	UHC	0.088	6	1 mg/L detection limits exceed the wastewater treatment standard.
1,3-Dichlorobenzene (m-dichlorobenzene)	U (1)	UHC Treatment Standard	UHC	0.036	6	1 mg/L detection limits exceed the wastewater treatment standard.
1,4-Dichlorobenzene (p-dichlorobenzene)	U (1)	7.5 (D027), UHC Treatment Standard	D027, UHC	0.09	6	1 mg/L detection limits exceed the wastewater treatment standard.

U = Not Detected (Detection limit in parenthesis).
J = Estimated Value

54172

INEEL V-2 Liquids, SVOC Analysis

Constituents	Concentration mg/L	Applicable Regulatory Limit	Applicable RCRA Waste Code	LDR Treatment Standard for wastewater in mg/l	LDR Treatment Standard for non-wastewater in mg/kg	Comments
3,3-Dichlorobenzidine (Dibenz (a,h) anthracene)	U (1)	UHC Treatment Standard	UHC	0.055	8.2	1 mg/L detection limits exceed the wastewater treatment standard.
2,4-Dichlorophenol	U (1)	UHC Treatment Standard	UHC	0.044	14	1 mg/L detection limits exceed the wastewater treatment standard.
Diethylphthalate	U (1)	UHC Treatment Standard	UHC	0.2	28	1 mg/L detection limits exceed the wastewater treatment standard.
2,4-Dimethylphenol	U (1)	UHC Treatment Standard	UHC	0.036	14	1 mg/L detection limits exceed the wastewater treatment standard.
Dimethylphthalate	U (1)	UHC Treatment Standard	UHC	0.047	28	1 mg/L detection limits exceed the wastewater treatment standard.
Di-n-butylphthalate	U (1)	UHC Treatment Standard	UHC	0.057	28	1 mg/L detection limits exceed the wastewater treatment standard.
Di-n-octylphthalate	U (1)	UHC Treatment Standard	UHC	0.017	28	1 mg/L detection limits exceed the wastewater treatment standard.
4,6-Dinitro-2-methylphenol	U (5)	None	NA	NA	NA	
2,4-Dinitrophenol	U (5)	UHC Treatment Standard	UHC	0.12	160	5 mg/L detection limits exceed the wastewater treatment standard.
2,4-Dinitrotoluene	U (1)	0.13 mg/L (D030), UHC Treatment Standard	D030, UHC	0.32	140	1 mg/L detection limits exceed the wastewater treatment standard.
2,6-Dinitrotoluene	U (1)	UHC Treatment Standard	UHC	0.55	28	1 mg/L detection limits exceed the wastewater treatment standard.
Fluoranthene	U (1)	UHC Treatment Standard	UHC	0.068	3.4	1 mg/L detection limits exceed the wastewater treatment standard.
Fluorene	U (1)	UHC Treatment Standard	UHC	0.059	3.4	1 mg/L detection limits exceed the wastewater treatment standard.

U = Not Detected (Detection limit in parenthesis).
J = Estimated Value

INEEL V-2 Liquids, SVOC Analysis

Constituents	Concentration mg/L	Applicable Regulatory Limit	Applicable RCRA Waste Code	LDR Treatment Standard for wastewater in mg/l	LDR Treatment Standard for non-wastewater in mg/kg	Comments
Hexachlorobenzene	U (1)	0.13 (D032), UHC Treatment Standard	D032, UHC	0.055	10	1 mg/L detection limits exceed the wastewater treatment standard.
Hexachlorobutadiene (Hexachloro-1,3-butadiene	U (1)	0.5 (D033)UHC Treatment Standard	D033, UHC	0.055	5.6	1 mg/L detection limits exceed the wastewater treatment standard.
Hexachlorocyclopentadiene	U (1)	UHC Treatment Standard	UHC	0.057	2.4	1 mg/L detection limits exceed the wastewater treatment standard.
Hexachloroethane	U (1)	3.0 mg/L (D034), UHC Treatment Standard	D034, UHC	0.055	30	1 mg/L detection limits exceed the wastewater treatment standard.
Indeno (1,2,3-cd) pyrene	U (1)	UHC Treatment Standard	UHC	0.0055	3.4	1 mg/L detection limits exceed the wastewater treatment standard.
Isophorone	U (1)	None	NA	NA	NA	
2-Methylnaphthalene	U (1)	None	NA	NA	NA	
2-Methylphenol (o-cresol)	U (1)	200 mg/L, UHC Treatment Standard	D023, UHC	0.11	5.6	1 mg/L detection limits exceed the wastewater treatment standard.
4-Methylphenol (p-cresol)	U (1)	200 mg/L, UHC Treatment Standard	D025, UHC	0.77	5.6	1 mg/L detection limits exceed the wastewater treatment standard.
Naphthalene	U (1)	UHC Treatment Standard	UHC	0.059	5.6	1 mg/L detection limits exceed the wastewater treatment standard.
2-Nitroaniline (o-nitroaniline)	U (5)	UHC Treatment Standard	UHC	0.27	14	5 mg/L detection limits exceed the wastewater treatment standard.

U = Not Detected (Detection limit in parenthesis).
J = Estimated Value

INEEL V-2 Liquids, SVOC Analysis

Constituents	Concentration mg/L	Applicable Regulatory Limit	Applicable RCRA Waste Code	LDR Treatment Standard for wastewater in mg/l	LDR Treatment Standard for non-wastewater in mg/kg	Comments
3-Nitroaniline (m-nitroaniline)	U (5)	None	NA	NA	NA	
4-Nitroaniline (p-nitroaniline)	U (5)	UHC Treatment Standard	UHC	0.028	28	5 mg/L detection limits exceed the wastewater treatment standard.
Nitrobenzene	U (1)	2.0 (D036) or UHC Treatment Standard	D036 or UHC	0.068	14	1 mg/L detection limits exceed the wastewater treatment standard.
2-Nitrophenol (o-nitrophenol)	U (1)	UHC Treatment Standard	UHC	0.028	13	1 mg/L detection limits exceed the wastewater treatment standard.
4-Nitrophenol (p-nitrophenol)	U (5)	UHC Treatment Standard	UHC	0.12	29	5 mg/L detection limits exceed the wastewater treatment standard.
N-nitroso-dimethylamine	U (1)	UHC Treatment Standard	UHC	0.4	2.3	1 mg/L detection limits exceed the wastewater treatment standard.
N-nitroso-di-n-propylamine (Di-n-propylnitrosamine)	U (1)	UHC Treatment Standard	UHC	0.4	14	1 mg/L detection limits exceed the wastewater treatment standard.
N-nitrosodiphenylamine (Diphenylnitrosamine)	U (1)	UHC Treatment Standard	UHC	0.92	13	1 mg/L detection limits exceed the wastewater treatment standard.
Pentachlorophenol	U (5)	100 mg/L (D037), UHC Treatment Standard	D037, UHC	0.089	7.4	5 mg/L detection limits exceed the wastewater treatment standard.
Phenanthrene	U (1)	UHC Treatment Standard	UHC	0.059	5.6	1 mg/L detection limits exceed the wastewater treatment standard.
Phenol	U (1)	UHC Treatment Standard	UHC	0.039	6.2	1 mg/L detection limits exceed the wastewater treatment standard.
Pyrene	U (1)	UHC Treatment Standard	UHC	0.067	8.2	1 mg/L detection limits exceed the wastewater treatment standard.

U = Not Detected (Detection limit in parenthesis).
J = Estimated Value

INEEL V-2 Liquids, SVOC Analysis

Constituents	Concentration mg/L	Applicable Regulatory Limit	Applicable RCRA Waste Code	LDR Treatment Standard for wastewater in mg/l	LDR Treatment Standard for non-wastewater in mg/kg	Comments
Pyridine	U (1)	5.0 (D038) or UHC Treatment Standard	D038 or UHC	0.014	16	1 mg/L detection limits exceed the wastewater treatment standard.
Tributylphosphate	NA	None	NA	NA	NA	
1,2,4-Trichlorobenzene	U (1)	UHC Treatment Standard	UHC	0.055	19	1 mg/L detection limits exceed the wastewater treatment standard.
2,4,5-Trichorophenol	U (5)	44 (D041), UHC Treatment Standard	D041, UHC	0.18	7.4	5 mg/L detection limits exceed the wastewater treatment standard.
2,4,6-Trichlorophenol	U (1)	2 (D042), UHC Treatment Standard	D042, UHC	0.035	7.4	1 mg/L detection limits exceed the wastewater treatment standard.

U = Not Detected (Detection limit in parenthesis).
J = Estimated Value

58 of 172

INEEL V-2 Liquid, Inorganic Analysis

Constituents	Concentration mg/L	Applicable Regulatory Limit	Applicable RCRA Waste Code	LDR Treatment Standard for wastewater in mg/L	LDR Treatment Standard for non-wastewater in mg/kg	Comments
Aluminum	U (0.2)	NA	NA	NA	NA	
Antimony	**0.215 R**	**UHC Treatment Standard**	**UHC**	**1.9**	**1.15 mg/L TCLP**	**This detected concentration was rejected. Therefore, waste must be re-analyzed to determine concentration.**
Arsenic	0.005 B	5.0 (D004), UHC Treatment Standard	D004, UHC	1.4	5.0 mg/L TCLP	
Barium	U (0.163) B J	100 mg/l (D005), UHC Treatment Standard	D005, UHC	1.2	21 mg/L TCLP	
Beryllium	U (0.0036) B	UHC Treatment Standard	UHC	0.82	1.22 mg/L TCLP	
Boron	2.17	NA	NA	NA	NA	
Cadmium	U (0.0044)	1.0 (D006), UHC	D006, UHC	0.69	0.11 mg/L TCLP	
Calcium	6.49	NA	NA	NA	NA	
Chromium	U (0.039)	5 (D007), UHC Treatment Standards	D007, UHC	2.77	0.60 mg/L TCLP	
Cobalt	U (0.033)	NA	NA	NA	NA	
Copper	U (0.01)	NA	NA	NA	NA	

U = Not Detected (Detection limit in parenthesis).
J = Estimated Value
B = Reported value is > to instrument detection limit but < contract required detection limit.
N = Spiked Sample recovery not within control limits.
R = Result rejected.

INEEL V-2 Liquid, Inorganic Analysis

Constituents	Concentration mg/L	Applicable Regulatory Limit	Applicable RCRA Waste Code	LDR Treatment Standard for wastewater in mg/L	LDR Treatment Standard for non-wastewater in mg/kg	Comments
Iron	0.437	NA	NA	NA	NA	
Lead	U (0.0036) N	5.0 (D008), UHC Treatment Standard	D008, UHC	0.69	0.75 mg/L TCLP	
Magnesium	14.6	NA	NA	NA	NA	
Manganese	0.475	NA	NA	NA	NA	
Mercury	U (0.001)	0.2 (D009), UHC Treatment Standard	D009, UHC	0.15	0.025 mg/L TCLP	
Nickel	0.457	UHC Treatment Standard	UHC	3.98	11 mg/L TCLP	
Potassium	276	NA	NA	NA	NA	
Selenium	U (0.005) J	1 (D010)	D010	0.82	5.7 mg/L TCLP	
Silicon	7.7	NA	NA	NA	NA	
Silver	U (0.0024)	5 (D011), UHC Treatment Standard	D011, UHC	0.43	0.14 mg/L TCLP	
Sodium	408	NA	NA	NA	NA	
Thallium	U (0.004) J	UHC Treatment Standard	UHC	1.4	0.2 mg/L TCLP	
Tin	NA	NA	NA	NA	NA	
Vanadium	U (0.0486) B	NA	NA	NA	NA	
Zinc	0.164	NA	NA	NA	NA	

U = Not Detected (Detection limit in parenthesis).
J = Estimated Value
B = Reported value is > to instrument detection limit but < contract required detection limit.
N = Spiked Sample recovery not within control limits.
R = Result rejected.

INEEL V-2 Liquid, Miscellaneous Analysis

Constituents	Concentration mg/L	Applicable Regulatory Limit	Applicable RCRA Waste Code	LDR Treatment Standard for wastewater in mg/L	LDR Treatment Standard for non-wastewater in mg/kg	Comments
Bromide	1.22	None	NA	NA	NA	
Chloride	136	None	NA	NA	NA	
Fluoride	U (5)	None	NA	NA	NA	
Nitrate	U (2)	None	NA	NA	NA	
Nitrite	U (4)	None	NA	NA	NA	
Phosphate	23.3	None	NA	NA	NA	
Sulfate	18	None	NA	NA	NA	
Total Organic Carbon	105	< 1%	NA	NA	NA	Wastewater is defined as < 1% TOC and < 1% TSS.
Total Halides	74.2	NA	NA	NA	NA	
Total Suspended Solids	26.7	<1%	NA	NA	NA	Wastewater is defined as < 1% TOC and < 1% TSS.
Oil & Grease	U (1)	None	NA	NA	NA	

U = Not Detected (Detection limit in parenthesis).
TOC = 105 mg/L = 1.05E-2 %, which is < 1%.TSS = 26.7 mg/L = 2.67 E-3% which is < 1%. Therefore, liquid phase is considered a wastewater.

01 of 172

INEEL V-2 Liquids, PCB Analysis

Constituents	Concentration mg/L	Applicable Regulatory Limit	Applicable TSCA/RCRA Waste Code	LDR Treatment Standard for wastewater in mg/L	LDR Treatment Standard for non-wastewater in mg/kg	Comments
Aroclor-1016	U (0.1)		None	NA	NA	
Aroclor-1221	U (0.2)	NA	NA	NA	NA	
Aroclor-1232	U (0.1)	NA	NA	NA	NA	
Aroclor-1242	U (0.1)	NA	NA	NA	NA	
Aroclor-1248	U (0.1)	NA	NA	NA	NA	
Aroclor-1254	U (0.1)	NA	NA	NA	NA	
Aroclor-1260	U (0.1)	NA	NA	NA	NA	
Total Concentration	U (0.1)	50 mg/kg for TSCA, UHC Treatment Standard for RCRA	None	0.1	10	This waste is not regulated under TSCA and it is below the UHC treatment standard level. Therefore, no PCB treatment is required prior to disposal.

U = Not Detected (Detection limit in parenthesis)

02 of 172

INEEL OU 1-10 Site TSF-09, Tank V-2
Preliminary Sludge Chemical Characterization Summary

- The sludge phase of the waste associated with this tank is considered a non-wastewater for purposes of complying with the Land Disposal Restrictions. This determination as well as the hazardous waste determination listed below is preliminary based on existing analytical data associated with this waste.

- **Hazardous Waste Determination:** Highest concentrations detected are reported.

  The RCRA Waste codes that apply to this waste are as follows:

Constituent	Concentration Detected in Waste (mg/kg)	Regulatory Limit (mg/L)	Applicable Waste Code	LDR Treatment Standard for non-wastewater (mg/kg)
Antimony	1.3 mg/L (theoretical)	1.15	UHC	1.15 mg/L
Cadmium	1.2 mg/L	1.0 (0.11 as a UHC)	D006	0.11 mg/L
Chromium	0.76 mg/L	0.6 as UHC	UHC	0.6 mg/L
Nickel	46.2 mg/L (theoretical)	11	UHC	11 mg/L
Bis(2-ethyl hexyl) phthalate	1500-7000	28 mg/kg as a UHC	UHC	28
Chloroethane	ND @ 10	6 mg/kg	UHC	6
1,2-Dichlorobenzene	30 J	None if F-listed, or 6 mg/kg as a UHC	UHC	6
2,4-Dinitrotoluene	ND @ 170 or 8.5 mg/L (theoretical)	0.13	D030	140
Hexachloroethane	ND @ 170 or 8.5 mg/L (theoretical)	3.0	D034	30
Pentachlorophenol	ND @ 870 or 43.5 mg/L (theoretical)	100	D037	7.4
Pyridine	ND @ 170 or 8.5 mg/L (theoretical)	5.0	D038	16
Tetrachloroethene	510 J (TCLP 2.387 mg/L)	0.7 mg/L as a D039, None if F-listed, or 6 as a UHC	D039	6
Trichloroethene	5.9 J D (TCLP 0.7 mg/L J D)	0.5 mg/L as a D040, None if F-listed, or 6 as a UHC	F001	6
Vinyl Chloride	ND @ 0.6 or ND @ 0.5 mg/L	0.2	D043	6
Total PCB Concentration	260 D	50 mg/kg for TSCA and UHC Treatment	TSCA Regulated and UHC	< 50 for TSCA and10 for RCRA

		Standard for RCRA		

Note: SVOCs are also identified to be present as UHCs. See write-up below.

- **UHC** = Underlying Hazardous Constituent.
  D = Dilution factor of 1000, Dilution factor of 50 for TCLP analysis, and Dilution factor of 10 for PCB analysis.
  J = Estimated Value.
  ND = Not Detected

- The inorganic analysis performed on the sludge phase of this waste was reported in a total concentration (mg/kg) and in a TCLP extract concentration (mg/L). Although high total concentrations are reported in this waste, the TCLP extract concentrations are typically below the regulatory limits as a characteristic waste. For the other inorganic analyses identified as UHCs, only total concentrations are reported. Therefore, to evaluate the regulatory status of these constituents in this solid, the total constituent concentration is divided by 20, creating the maximum theoretical leachate concentration (as referenced in the table above), which is then compared to the applicable regulatory limit. The division factor reflects the 20-to-1 ratio of extraction fluid to solid used in the TCLP test method.

- Chloroethane reported a detection limit of 10 mg/kg, however the non-wastewater treatment standard is 6 mg/kg. LDR guidance suggests that in cases where detection limits are above either the characteristic limit or treatment standards, the generator may use his knowledge of the waste, in lieu of analytical results, to certify that the constituent(s) are not present in the waste. However, since this waste will not be re-analyzed for Chloroethanethis constituent is assumed to be present in the waste at the detection limit value.

  Trichloroethene was detected at 0.7 mg/L based on TCLP analysis. This concentration exceeds the characteristic limit. However, the LDR non-wastewater treatment standard for Trichloroethene is 6 mg/kg, a total concentration value. The total concentration of Trichloroethene is 5.9 mg/kg, albeit an estimated value, which is below the non-wastewater treatment standard value of 6 mg/kg. Since the total concentration is an estimated value based on the laboratory reporting values for this constituent, Trichloroethene is conservatively identified as requiring LDR treatment.

  Vinyl chloride was not detected in the sludge at 0.6 mg/kg and at 0.5 mg/L based on TCLP analysis. The characteristic limit for vinyl chloride is 0.2 mg/L. The TCLP detection limit exceeds this characteristic limit, therefore it is uncertain if this waste exceeds the toxicity characteristic based on TCLP analysis. However, the treatment standard for vinyl chloride, either as a toxicity characteristic or as an underlying hazardous constituent (UHC), is 6 mg/kg and vinyl chloride was not detected at 0.6 mg/kg. Based on this information vinyl chloride is conservatively assumed to be present as a characteristic constituent, however no treatment for purposes of complying with the Land Disposal Restrictions (LDRs) would be required.

- The detection limits for a majority of the SVOCs were above the non-wastewater treatment standards, as well as the characteristic limits for several constituents. Again as previously stated, LDR guidance suggests that in cases where detection limits are above either the characteristic limit or treatment standards, the generator may use his knowledge of the waste, in lieu of analytical results, to certify that these constituents are not present in the waste. However, since this waste will not be re-analyzed for these constituents, the following SVOCs are also assumed to be present in the waste at the detection limit value(see attached tables for concentrations) and are identified as underlying hazardous constituents (The table above identifies only those SVOCs with detection limits exceeding characteristic limits.): Acenaphthene, Acenaphthylene, Anthracene, Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(g,h,I)perylene, Benzo(k)fluoranthene, Butylbenzylphthalate, Bis (2-chloroethoxy) methane, Bis (2-chloroethyl) ether, Bis (2-chloroisopropyl) ether, 4-Bromophenyl-phenylether, Chrysene, 4-Chloroaniline, 4-Chloro-3-Methylphenol, 2-Chloronaphthalene, 2-Chlorophenol, Dibenz(a,h)anthracene, 1,2-Dichlorobenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 3,3-Dichlorobenzidine, 2,4-Dichlorophenol, Diethylphthalate, 2,4-Dimethylphthalate, Dimethylphthalate, Di-n-butylphthalate, Di-n-octylphthalate, 2,4-Dinitrophenol, 2,6-Dinitrotoluene, Fluoranthene, Fluorene, Hexachlorobenzene, Hexachlorobutadiene, Hexachlorocyclopentadiene, Indeno(1,2,3-cd)pyrene, 2-Methylphenol, 4-Methylphenol, Napthalene, 2-Nitroaniline, 4-Nitroaniline, Nitrobenzene, 2-Nitrophenol, 4-Nitrophenol, N-nitroso-dimethylamine, N-nitroso-di-n-propylamine, N-nitrosodiphenylamine, Phenanthrene, Phenol, Pyrene, 1,2,4-Trichlorobenzene, 2,4,5-Trichlorophenol, and 2,4,6-Trichlorophenol.

- Based on a review of the analytical data provided by INEEL, this waste is considered both characteristic, with underlying hazardous constituents and a listed hazardous waste as well as TSCA regulated due to the presence of PCBs > 50 ppm. This waste requires incineration based on 40 CFR 761 for the presence of PCBs and any form of thermal treatment for the presence of the organic constituents, followed-by stabilization of the ash for the inorganic constituents.

- **Recommendation:**

  Since this waste will require some form of thermal treatment due to the presence of organics, the waste acceptance criteria of possible treatment facilities should also be considered.

INEEL V-2 Sludge, VOC Analysis

Constituents	Concentration mg/kg	Applicable Regulatory Limit	Applicable RCRA Waste Code	LDR Treatment Standard for wastewater in mg/L	LDR Treatment Standard for non-wastewater in mg/kg	Comments
Acetone	U (0.6) J	Treatment standard limit if UHC	UHC	0.28	160	
Benzene	U (0.6) J U (0.5) J D, TCLP	0.5 mg/l (D018) or treatment standard limit if UHC	D018 or UHC	0.14	10	
Bromodichloromethane	U (0.6) J	Treatment standard limit if UHC	UHC	0.35	15	
Bromoform (Tribromomethane)	U (0.6) J	Treatment standard limit if UHC	UHC	0.63	15	
Bromomethane	U (0.6) J	Treatment standard limit if UHC	UHC	0.11	15	
2-Butanone (MEK)	U (0.6) J	200 mg/l (D035) or treatment standard limit if UHC	D035 or UHC	0.28	36	
Carbon disulfide	U (0.6) J	Treatment standard limit if UHC	UHC	3.8	4.8 mg/L	

U = Not Detected (Detection limit in parenthesis).
J = Estimated Value
D = Dilution factor of 50 for TCLP analysis and 1000 for total analysis.

INEEL V-2 Sludge, VOC Analysis

Constituents	Concentration mg/kg	Applicable Regulatory Limit	Applicable RCRA Waste Code	LDR Treatment Standard for wastewater in mg/L	LDR Treatment Standard for non-wastewater in mg/kg	Comments
Carbon tetrachloride	U (0.6) J U (0.5) J D, TCLP	0.5 mg/L (D019) or treatment standard limit if UHC	D019 or UHC	0.057	6	
Chlorobenzene	U (0.6) J U (0.5) J D, TCLP	100 mg/l (D021) or treatment standard limit if UHC	D021 or UHC	0.057	6	
Chloroethane	U (10)	Treatment standard limit if UHC	UHC	0.27	6	The 10 mg/kg detection limit exceeds the nww treatment standard.
Chloroform	U (0.6) J U (0.5) J D, TCLP	6 mg/l (D022) or treatment standard limit if UHC	D022 or UHC	0.046	6	
Chloromethane	U (0.6) J	Treatment standard limit if UHC	UHC	0.19	30	
Dibromochloromethane (Chlorodibromomethane)	U (0.6) J	Treatment standard limit if UHC	UHC	0.057	15	
1,1-Dichloroethane	U (0.6) J	Treatment standard limit if UHC	UHC	0.059	6	

U = Not Detected (Detection limit in parenthesis).
J = Estimated Value
D = Dilution factor of 50 for TCLP analysis and 1000 for total analysis.

INEEL V-2 Sludge, VOC Analysis

Constituents	Concentration mg/kg	Applicable Regulatory Limit	Applicable RCRA Waste Code	LDR Treatment Standard for wastewater in mg/L	LDR Treatment Standard for non-wastewater in mg/kg	Comments
1,2-Dichloroethane	U (0.6) J U (0.5) J D, TCLP	0.5 mg/l (D028), or treatment standard limit if UHC	D028 or UHC	0.21	6	
1,1-Dichloroethene	U (0.6) J U (0.5) J D, TCLP	0.7 mg/l (D029) or treatment standard limit if UHC	D029 or UHC	0.025	6	
trans-1,2-Dichloroethene	U (0.6) J	Treatment standard limit if UHC	UHC	0.054	30	
1,2-Dichloropropane	U (0.6) J	Treatment standard limit if UHC	UHC	0.85	18	
cis-1,3-Dichloropropene	U (0.6) J	Treatment standard limit if UHC	UHC	0.036	18	
trans-1,3-Dichloropropene	U (0.6) J	Treatment standard limit if UHC	UHC	0.036	18	
Ethylbenzene	U (0.6) J	Treatment standard limit if UHC	UHC	0.057	10	
2-Hexanone (Methyl n-butyl ketone)	U (0.6) J	NA	NA	NA	NA	

U = Not Detected (Detection limit in parenthesis).
J = Estimated Value
D = Dilution factor of 50 for TCLP analysis and 1000 for total analysis.

INEEL V-2 Sludge, VOC Analysis

Constituents	Concentration mg/kg	Applicable Regulatory Limit	Applicable RCRA Waste Code	LDR Treatment Standard for wastewater in mg/L	LDR Treatment Standard for non-wastewater in mg/kg	Comments
4-Methyl-2-pentanone (MIK)	U (0.6) J	Treatment standard limit if UHC	UHC	0.14	33	
Methylene chloride	U (0.6) J	Treatment standard limit if UHC	UHC	0.089	30	
Styrene	U (0.6) J	NA	NA	NA	NA	
1,1,2,2-Tetrachloroethane	U (0.6) J	Treatment standard limit if UHC	UHC	0.057	6	
Tetrachloroethene	**510 J 2.387 mg/L J D, TCLP**	**0.7 mg/l (D039) or treatment standard limit if UHC**	**D039 or UHC**	**0.056**	**6**	**2.3 mg/L is below the characteristic limit. However, the 510 mg/kg concentration exceeds the nww treatment standard. Therefore, it may be either F-listed or a UHC, requiring treatment.**
Toluene	U (0.6) J	Treatment standard limit if UHC	UHC	0.08	10	
1,1,1-Trichloroethane	U (0.6) J	Treatment standard limit if UHC	UHC	0.054	6	
1,1,2-Trichloroethane	U (0.6) J	Treatment standard limit if UHC	UHC	0.054	6	

U = Not Detected (Detection limit in parenthesis).
J = Estimated Value
D = Dilution factor of 50 for TCLP analysis and 1000 for total analysis.

INEEL V-2 Sludge, VOC Analysis

Constituents	Concentration mg/kg	Applicable Regulatory Limit	Applicable RCRA Waste Code	LDR Treatment Standard for wastewater in mg/L	LDR Treatment Standard for non-wastewater in mg/kg	Comments
Trichloroethene	**5.9 J D 0.7 mg/L J D, TCLP**	**None if listed**	**F001**	**0.054**	**6**	**0.7 mg/L exceeds the characteristic limit, however the total concentration is below the non-wastewater treatment standard. Therefore no treatment is required regardless if it is D040, F002 or UHC.**
Vinyl chloride	**U (0.6) J U (0.5) J D, TCLP**	**0.2 mg/l (D043), orTreatment standard limit if UHC**	**D043 or UHC**	**0.27**	**6**	**0.5 mg/L detection limit for TCLP exceeds the characteristic limit of 0.2 mg/L. However, the 0.6 mg/kg detection limit is below the treatment standard. Therefore, no treatment would be required regardless if it is a D043 or a UHC.**
Xylene (ortho)	U (0.6) J	NA	NA	NA	NA	
Xylene (total meta and para)	U (0.6) J	Treatment standard limit if UHC	UHC	0.32	30	

U = Not Detected (Detection limit in parenthesis).
J = Estimated Value
D = Dilution factor of 50 for TCLP analysis and 1000 for total analysis.

INEEL V-2 Sludge, SVOC analysis.

Constituents	Concentration mg/kg	Applicable Regulatory Limit	Applicable RCRA Waste Code	LDR Treatment Standard for wastewater in mg/l	LDR Treatment Standard for non-wastewater in mg/kg	Comments
Acenaphthene	U (170)	UHC Treatment Standard	UHC	0.059	3.4	170 mg/kg detection limit exceeds the nww treatment standard.
Acenaphthylene	U (170)	UHC Treatment Standard	UHC	0.059	3.4	170 mg/kg detection limit exceeds the nww treatment standard.
Anthracene	U (170)	UHC Treatment Standard	UHC	0.059	3.4	170 mg/kg detection limit exceeds the nww treatment standard.
Benzo (a) anthracene	U (170)	UHC Treatment Standard	UHC	0.059	3.4	170 mg/kg detection limit exceeds the nww treatment standard.
Benzo (a) pyrene	U (170)	UHC Treatment Standard	UHC	0.061	3.4	170 mg/kg detection limit exceeds the nww treatment standard.
Benzo (b) fluoranthene	U (170)	UHC Treatment Standard	UHC	0.11	6.8	170 mg/kg detection limit exceeds the nww treatment standard.
Benzo (g,h,I) perylene	U (170)	UHC Treatment Standard	UHC	0.0055	1.8	170 mg/kg detection limit exceeds the nww treatment standard.
Benzo (k) fluoranthene	U (170)	UHC Treatment Standard	UHC	0.11	6.8	170 mg/kg detection limit exceeds the nww treatment standard.
Benzoic acid	U (870)	None	NA	NA	NA	
Benzyl alcohol	U (870)	None	NA	NA	NA	
Butylbenzylphthalate	U (170)	UHC Treatment Standard	UHC	0.017	28	170 mg/kg detection limit exceeds the nww treatment standard.
Bis (2-chloroethoxy)methane	U (170)	UHC Treatment Standard	UHC	0.036	7.2	170 mg/kg detection limit exceeds the nww treatment standard.
Bis (2-chloroethyl)ether	U (170)	UHC Treatment Standard	UHC	0.033	6	170 mg/kg detection limit exceeds the nww treatment standard.
Bis (2-chloroisopropyl) ether	U (170)	UHC Treatment Standard	UHC	0.055	7.2	170 mg/kg detection limit exceeds the nww treatment standard.

U = Not Detected (Detection limit in parenthesis).
J = Estimated Value

72 of 122

INEEL V-2 Sludge, SVOC analysis.

Constituents	Concentration mg/kg	Applicable Regulatory Limit	Applicable RCRA Waste Code	LDR Treatment Standard for wastewater in mg/l	LDR Treatment Standard for non-wastewater in mg/kg	Comments
Bis (2-ethylhexyl) phthalate	**1500-7000**	**UHC Treatment Standard**	**UHC**	**0.28**	**28**	**1500-7000 mg/kg concentration exceeds the nww treatment standard. Therefore this constituent is a UHC.**
4-Bromophenyl-phenylether	U (170)	UHC Treatment Standard	UHC	0.055	15	170 mg/kg detection limit exceeds the nww treatment standard.
Carbozole (or Carbazole)	U (170)	None	NA	NA	NA	
Chrysene	U (170)	UHC Treatment Standard	UHC	0.059	3.4	170 mg/kg detection limit exceeds the nww treatment standard.
4-Chloroaniline (p-chloroaniline)	U (170)	UHC Treatment Standard	UHC	0.46	16	170 mg/kg detection limit exceeds the nww treatment standard.
4-Chloro-3-Methylphenol (p-chloro-m-cresol)	U (170)	UHC Treatment Standard	UHC	0.018	14	170 mg/kg detection limit exceeds the nww treatment standard.
2-Chloronaphthalene	U (170)	UHC Treatment Standard	UHC	0.055	5.6	170 mg/kg detection limit exceeds the nww treatment standard.
4-Chlorophenyl-phenylether	U (170)	None	NA	NA	NA	
2-Chlorophenol	U (170)	UHC Treatment Standard	UHC	0.044	5.7	170 mg/kg detection limit exceeds the nww treatment standard.
Dibenz(a,h)anthracene	U (170)	UHC Treatment Standard	UHC	0.055	8.2	170 mg/kg detection limit exceeds the nww treatment standard.
Dibenzofuran	U (170)	None	NA	NA	NA	
1,2-Dichlorobenzene (o-dichlorobenzene)	**30 J**	**UHC Treatment Standard**	**UHC**	**0.088**	**6**	**30 mg/kg concentration exceeds the nww treatment standard. Therefore this constituent is a UHC or an F-listed constituent.**
1,3-Dichlorobenzene (m-dichlorobenzene)	U (170)	UHC Treatment Standard	UHC	0.036	6	170 mg/kg detection limit exceeds the nww treatment standard.

U = Not Detected (Detection limit in parenthesis).
J = Estimated Value

INEEL V-2 Sludge, SVOC analysis.

Constituents	Concentration mg/kg	Applicable Regulatory Limit	Applicable RCRA Waste Code	LDR Treatment Standard for wastewater in mg/l	LDR Treatment Standard for non-wastewater in mg/kg	Comments
1,4-Dichlorobenzene (p-dichlorobenzene)	U (170)	7.5 (D027), UHC Treatment Standard	D027, UHC	0.09	6	170 mg/kg detection limit exceeds the nww treatment standard.
3,3-Dichlorobenzidine (Dibenz (a,h) anthracene)	U (170)	UHC Treatment Standard	UHC	0.055	8.2	170 mg/kg detection limit exceeds the nww treatment standard.
2,4-Dichlorophenol	U (170)	UHC Treatment Standard	UHC	0.044	14	170 mg/kg detection limit exceeds the nww treatment standard.
Diethylphthalate	U (170)	UHC Treatment Standard	UHC	0.2	28	170 mg/kg detection limit exceeds the nww treatment standard.
2,4-Dimethylphenol	U (170)	UHC Treatment Standard	UHC	0.036	14	170 mg/kg detection limit exceeds the nww treatment standard.
Dimethylphthalate	U (170)	UHC Treatment Standard	UHC	0.047	28	170 mg/kg detection limit exceeds the nww treatment standard.
Di-n-butylphthalate	U (170)	UHC Treatment Standard	UHC	0.057	28	170 mg/kg detection limit exceeds the nww treatment standard.
Di-n-octylphthalate	U (170)	UHC Treatment Standard	UHC	0.017	28	170 mg/kg detection limit exceeds the nww treatment standard.
4,6-Dinitro-2-methylphenol	U (870)	None	NA	NA	NA	
2,4-Dinitrophenol	U (870)	UHC Treatment Standard	UHC	0.12	160	870 mg/kg detection limit exceeds the nww treatment standard.
2,4-Dinitrotoluene	U (170)	0.13 mg/L (D030), UHC Treatment Standard	D030, UHC	0.32	140	170 mg/kg detection limit exceeds the nww treatment standard. Using 170 mg/kg, the theoretical leachate value is 8.5 mg/L which exceeds the characteristic limit. Therefore, this may be a characteristic constituent or a UHC.

U = Not Detected (Detection limit in parenthesis).
J = Estimated Value

74 of 172

INEEL V-2 Sludge, SVOC analysis.

Constituents	Concentration mg/kg	Applicable Regulatory Limit	Applicable RCRA Waste Code	LDR Treatment Standard for wastewater in mg/l	LDR Treatment Standard for non-wastewater in mg/kg	Comments
2,6-Dinitrotoluene	U (170)	UHC Treatment Standard	UHC	0.55	28	170 mg/kg detection limit exceeds the nww treatment standard.
Fluoranthene	U (170)	UHC Treatment Standard	UHC	0.068	3.4	170 mg/kg detection limit exceeds the nww treatment standard.
Fluorene	U (170)	UHC Treatment Standard	UHC	0.059	3.4	170 mg/kg detection limit exceeds the nww treatment standard.
Hexachlorobenzene	U (170)	0.13 (D032), UHC Treatment Standard	D032, UHC	0.055	10	170 mg/kg detection limit exceeds the nww treatment standard.
Hexachlorobutadiene (Hexachloro-1,3-butadiene	U (170)	0.5 (D033)UHC Treatment Standard	D033, UHC	0.055	5.6	170 mg/kg detection limit exceeds the nww treatment standard.
Hexachlorocyclopentadiene	U (170)	UHC Treatment Standard	UHC	0.057	2.4	170 mg/kg detection limit exceeds the nww treatment standard.
Hexachloroethane	U (170)	3.0 mg/L (D034), UHC Treatment Standard	D034, UHC	0.055	30	170 mg/kg detection limit exceeds the nww treatment standard. Using 170 mg/kg, the theoretical leachate value is 8.5 mg/L which exceeds the characteristic limit. Therefore, this may be a characteristic constituent or a UHC.
Indeno (1,2,3-cd) pyrene	U (170)	UHC Treatment Standard	UHC	0.0055	3.4	170 mg/kg detection limit exceeds the nww treatment standard.
Isophorone	U (170)	None	NA	NA	NA	
2-Methylnaphthalene	57 J	None	NA	NA	NA	
2-Methylphenol (o-cresol)	U (170)	200 mg/L or UHC treatment standard	D023, UHC	0.11	5.6	170 mg/kg detection limit exceeds the nww treatment standard.

U = Not Detected (Detection limit in parenthesis).
J = Estimated Value

INEEL V-2 Sludge, SVOC analysis.

Constituents	Concentration mg/kg	Applicable Regulatory Limit	Applicable RCRA Waste Code	LDR Treatment Standard for wastewater in mg/l	LDR Treatment Standard for non-wastewater in mg/kg	Comments
4-Methylphenol (p-cresol)	U (170)	200 mg/L or UHC treatment standard	D025, UHC	0.77	5.6	170 mg/kg detection limit exceeds the nww treatment standard.
Naphthalene	U (170)	UHC Treatment Standard	UHC	0.059	5.6	170 mg/kg detection limit exceeds the nww treatment standard.
2-Nitroaniline (o-nitroaniline)	U (870)	UHC Treatment Standard	UHC	0.27	14	870 mg/kg detection limit exceeds the nww treatment standard.
3-Nitroaniline (m-nitroaniline)	U (870)	None	NA	NA	NA	
4-Nitroaniline (p-nitroaniline)	U (870)	UHC Treatment Standard	UHC	0.028	28	870 mg/kg detection limit exceeds the nww treatment standard.
Nitrobenzene	U (170)	2.0 (D036) or UHC Treatment Standard	D036 or UHC	0.068	14	170 mg/kg detection limit exceeds the nww treatment standard.
2-Nitrophenol (o-nitrophenol)	U (170)	UHC Treatment Standard	UHC	0.028	13	170 mg/kg detection limit exceeds the nww treatment standard.
4-Nitrophenol (p-nitrophenol)	U (870)	UHC Treatment Standard	UHC	0.12	29	870 mg/kg detection limit exceeds the nww treatment standard.
N-nitroso-dimethylamine	NA	UHC Treatment Standard	UHC	0.4	2.3	
N-nitroso-di-n-propylamine (Di-n-propylnitrosamine)	U (170)	UHC Treatment Standard	UHC	0.4	14	170 mg/kg detection limit exceeds the nww treatment standard.
N-nitrosodiphenylamine (Diphenylnitrosamine)	U (170)	UHC Treatment Standard	UHC	0.92	13	170 mg/kg detection limit exceeds the nww treatment standard.

U = Not Detected (Detection limit in parenthesis).
J = Estimated Value

72 of 172

INEEL V-2 Sludge, SVOC analysis.

Constituents	Concentration mg/kg	Applicable Regulatory Limit	Applicable RCRA Waste Code	LDR Treatment Standard for wastewater in mg/l	LDR Treatment Standard for non-wastewater in mg/kg	Comments
Pentachlorophenol	U (870)	100 mg/L (D037), UHC Treatment Standard	D037, UHC	0.089	7.4	870 mg/kg detection limit exceeds the nww treatment standard. Using 870 mg/kg, the theoretical leachate value is 43.5 mg/L which exceeds the characteristic limit. Therefore, this may be a characteristic constituent or a UHC.
Phenanthrene	U (170)	UHC Treatment Standard	UHC	0.059	5.6	170 mg/kg detection limit exceeds the nww treatment standard.
Phenol	U (170)	UHC Treatment Standard	UHC	0.039	6.2	170 mg/kg detection limit exceeds the nww treatment standard.
Pyrene	U (170)	UHC Treatment Standard	UHC	0.067	8.2	170 mg/kg detection limit exceeds the nww treatment standard.
Pyridine	U (170)	5.0 (D038) or UHC Treatment Standard	D038 or UHC	0.014	16	170 mg/kg detection limit exceeds the nww treatment standard. Using 170 mg/kg, the theoretical leachate value is 8.5 mg/L which exceeds the characteristic limit. Therefore, this may be a characteristic constituent or a UHC.
Tributylphosphate	NA	None	NA	NA	NA	
1,2,4-Trichlorobenzene	U (170)	UHC Treatment Standard	UHC	0.055	19	170 mg/kg detection limit exceeds the nww treatment standard.
2,4,5-Trichorophenol	U (870)	44 (D041), UHC Treatment Standard	D041, UHC	0.18	7.4	870 mg/kg detection limit exceeds the nww treatment standard.
2,4,6-Trichlorophenol	U (170)	2 (D042), UHC Treatment Standard	D042, UHC	0.035	7.4	170 mg/kg detection limit exceeds the nww treatment standard.

U = Not Detected (Detection limit in parenthesis).
J = Estimated Value

INEEL V-2 Sludge, Inorganic Analysis

Constituents	Concentration mg/kg	Applicable Regulatory Limit	Applicable RCRA Waste Code	LDR Treatment Standard for wastewater in mg/L	LDR Treatment Standard for non-wastewater in mg/kg	Comments
Aluminum	7570	NA	NA	NA	NA	
Antimony	**25.9 B**	**UHC Treatment Standard**	**UHC**	**1.9**	**1.15 mg/L TCLP**	**Using 25.9 mg/kg, the theoretical leachate value is 1.3 mg/L .**
Arsenic	18.5 B U (0.0386), TCLP	5.0 (D004), UHC Treatment Standard	D004, UHC	1.4	5.0 mg/L TCLP	
Barium	187 1.15 mg/L TCLP	100 mg/l (D005), UHC Treatment Standard	D005, UHC	1.2	21 mg/L TCLP	
Beryllium	22	UHC Treatment Standard	UHC	0.82	1.22 mg/L TCLP	Using 22 mg/kg, the theoretical leachate value is 1.1 mg/L .
Boron	72 J	NA	NA	NA	NA	
Cadmium	**253 1.2 mg/L, TCLP**	**1.0 (D006), UHC**	**D006, UHC**	**0.69**	**0.11 mg/L TCLP**	**1.2 mg/L TCLP concentration exceeds both the characteristic limit and the nww treatment standard limit.**
Calcium	38600 D	NA	NA	NA	NA	
Chromium	**1680 0.76 mg/L TCLP**	**5 (D007), UHC Treatment Standards**	**D007, UHC**	**2.77**	**0.60 mg/L TCLP**	**Using 0.76 mg/L concentration this waste is below the characteristic limit, however it exceeds the nww treatment standard. Therefore, this constituent is a UHC.**
Cobalt	7.41 B	NA	NA	NA	NA	

U = Not Detected (Detection limit in parenthesis).
J = Estimated Value
B = Reported value is > to instrument detection limit but < contract required detection limit.
D = Dilution Factor of 10.

78 of 122

INEEL V-2 Sludge, Inorganic Analysis

Constituents	Concentration mg/kg	Applicable Regulatory Limit	Applicable RCRA Waste Code	LDR Treatment Standard for wastewater in mg/L	LDR Treatment Standard for non-wastewater in mg/kg	Comments
Copper	926	NA	NA	NA	NA	
Iron	22400	NA	NA	NA	NA	
Lead	1550 0.052 mg/L, TCLP	5.0 (D008), UHC Treatment Standard	D008, UHC	0.69	0.75 mg/L TCLP	
Magnesium	7030 D	NA	NA	NA	NA	
Manganese	27100 D	NA	NA	NA	NA	
Mercury	612 0.00018 mg/L, TCLP	0.2 (D009), UHC Treatment Standard	D009, UHC	0.15	0.025 mg/L TCLP	
Nickel	**925 J**	**UHC Treatment Standard**	**UHC**	**3.98**	**11 mg/L TCLP**	**Using 925 mg/kg, the theoretical leachate value is 46.2 mg/L which is above the nww treatment standard limt. This is a UHC.**
Potassium	5520 J	NA	NA	NA	NA	
Selenium	7.8 B U (0.047) mg/L, TCLP	1 (D010)	D010	0.82	5.7 mg/L TCLP	
Silicon	4510 J	NA	NA	NA	NA	
Silver	315 0.022 mg/L, TCLP	5 (D011), UHC Treatment Standard	D011, UHC	0.43	0.14 mg/L TCLP	
Sodium	2330 J	NA	NA	NA	NA	
Thallium	U (2.1)	UHC Treatment Standard	UHC	1.4	0.2 mg/L TCLP	Using 2.1 mg/kg, the theoretical leachate value is 0.1 mg/L which is below the nww treatment standard limt.
Tin	NA	NA	NA	NA	NA	

U = Not Detected (Detection limit in parenthesis).
J = Estimated Value
B = Reported value is > to instrument detection limit but < contract required detection limit.
D = Dilution Factor of 10.

INEEL V-2 Sludge, Inorganic Analysis

Constituents	Concentration mg/kg	Applicable Regulatory Limit	Applicable RCRA Waste Code	LDR Treatment Standard for wastewater in mg/L	LDR Treatment Standard for non-wastewater in mg/kg	Comments
Vanadium	U (0.76)	NA	NA	NA	NA	
Zinc	4370 J	NA	NA	NA	NA	

U = Not Detected (Detection limit in parenthesis).
J = Estimated Value
B = Reported value is > to instrument detection limit but < contract required detection limit.
D = Dilution Factor of 10.

INEEL V-2 Sludge, Miscellaneous Analysis

Constituents	Concentration mg/kg	Applicable Regulatory Limit	Applicable RCRA Waste Code	LDR Treatment Standard for wastewater in mg/L	LDR Treatment Standard for non-wastewater in mg/kg	Comments
Bromide	1.22	None	NA	NA	NA	
Chloride	136	None	NA	NA	NA	
Fluoride	U (5)	None	NA	NA	NA	
Nitrate	U (2)	None	NA	NA	NA	
Nitrite	U (4)	None	NA	NA	NA	
Phosphate	21.1	None	NA	NA	NA	
Sulfate	186	None	NA	NA	NA	
Total Organic Carbon	200,000	< 1%	NA	NA	NA	Wastewater is defined as < 1% TOC and < 1% TSS.
Total Halides	1240	NA	NA	NA	NA	
Total Suspended Solids	NA	<1%	NA	NA	NA	Wastewater is defined as < 1% TOC and < 1% TSS.
pH	7.6-7.9	≤ 2 or ≥ 12.5	None	NA	NA	
Density	1.01-1.03					

U = Not Detected (Detection limit in parenthesis).
B = Not defined in INEEL.
NP = Analysis not performed.
TOC = 200000 mg/kg = 20 %, which is > 1%. This sludge is considered a non-wastewater.

8/of 172

INEEL V-2 Sludge, PCB Analysis

Constituents	Concentration mg/kg	Applicable Regulatory Limit	Applicable TSCA/RCRA Waste Code	LDR Treatment Standard for wastewater in mg/L	LDR Treatment Standard for non-wastewater in mg/kg	Comments
Aroclor-1016	U (13)		None	NA	NA	
Aroclor-1221	U (26)	NA	NA	NA	NA	
Aroclor-1232	U (13)	NA	NA	NA	NA	
Aroclor-1242	U (13)	NA	NA	NA	NA	
Aroclor-1248	U (13)	NA	NA	NA	NA	
Aroclor-1254	U (13)	NA	NA	NA	NA	
Aroclor-1260	260 D	NA	NA	NA	NA	
Total Concentration	260 D	50 mg/kg for TSCA, UHC Treatment Standard for RCRA	None	0.1	10	This waste is regulated under TSCA and it may be subject to the UHC treatment standard level. Therefore, this waste must be incinerated prior to disposal for purposes of PCBs.

U = Not Detected (Detection limit in parenthesis).
D = Dilution Factor of 10

INEEL OU 1-10 Site TSF-09, Tank V-3
Preliminary Liquid Phase Chemical Characterization Summary

- The liquid phase of the waste associated with this tank is considered a wastewater for purposes of complying with the Land Disposal Restrictions, in that it contains <1% TOC and <1% TSS. This determination as well as the hazardous waste determination listed below is preliminary based on existing analytical data.

- **Hazardous Waste Determination:** Highest concentrations detected in the waste are reported.

The RCRA Waste codes that apply to this waste are as follows:

Constituent	Concentration Detected in Waste (mg/L)	Regulatory Limit (mg/L)	Applicable Waste Code	LDR Treatment Standard for wastewater (mg/L)
Chloromethane	0.01	0.19	UHC	0.19
2,4-Dinitrotoluene	ND @ 1	0.13	D030	0.32
Hexachlorobenzene	ND @ 1	0.13	D032	0.055
Hexachlorobutadiene	ND @ 1	0.5	D033	0.055
Trichloroethene	0.2	0.5 mg/L as D040, None if F-listed, or 0.054 as a UHC	F001	0.054

- UHC = Underlying Hazardous Constituent
  ND = Not Detected
- Based on a review of the inorganic analysis, antimony is the only constituent, which appears to require re-analysis, since the data was rejected during data validation and determined to be unusable. Since antimony is only regulated as an underlying hazardous constituent, re-analysis is not required since this waste does not exhibit a characteristic of a hazardous waste, triggering the requirement to treat for underlying hazardous constituents.
- Based on a review of the volatile organic analysis, chloromethane is the only constituent, which appears to require re-analysis, since the data was rejected during data validation and determined to be unusable. Therefore, chloromethane is assumed to be present at the detection limit value and identified as an underlying hazardous constituent.
- The detection limits for a majority of the SVOCs, except for bis(2-ethylhexyl) phthalate and pyrene, were above the wastewater treatment standards. However, since this waste will not be re-analyzed for these constituents, the following SVOCs are also assumed to be present in the waste at the detection limit value (see attached tables for concentrations) and are identified as underlying hazardous constituents: Acenaphthene, Acenaphthylene, Anthracene, Benzo(a)anthracene, Benzo(a)pyrene,

Benzo(b)fluoranthene, Benzo(g,h,I)perylene, Benzo(k)fluoranthene, Butylbenzylphthalate, Bis (2-chloroethoxy) methane, Bis (2-chloroethyl) ether, Bis (2-chloroisopropyl) ether, 4-Bromophenyl-phenylether, Chrysene, 4-Chloroaniline, 4-Chloro-3-Methylphenol, 2-Chloronaphthalene, 2-Chlorophenol, Dibenz(a,h)anthracene, 1,2-Dichlorobenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 3,3-Dichlorobenzidine, 2,4-Dichlorophenol, Diethylphthalate, 2,4-Dimethylphthalate, Dimethylphthalate, Di-n-butylphthalate, Di-n-octylphthalate, 2,4-Dinitrophenol, 2,6-Dinitrotoluene, Fluoranthene, Fluorene, Hexachlorocyclopentadiene, Hexachloroethane, Indeno(1,2,3-cd) pyrene, 2-Methylphenol, 4-Methylphenol, Napthalene, 2-Nitroaniline, 4-Nitroaniline, Nitrobenzene, 2-Nitrophenol, 4-Nitrophenol, N-nitroso-dimethylamine, N-nitroso-di-n-propylamine, N-nitrosodiphenylamine, Pentachlorophenol, Phenanthrene, Phenol, Pyrene, Pyridine, 1,2,4-Trichlorobenzene, 2,4,5-Trichlorophenol, and2,4,6-Trichlorophenol..Three of the SVOC constituents (2,4-Dinitrotoluene, Hexachlorobenzene, and Hexachlorobutadiene) also had detection limit above the toxicity characteristic levels. LDR guidance suggests that in cases where detection limits are above either the characteristic limit or treatment standards, the generator may use his knowledge of the waste, in lieu of analytical results, to certify that the constituent(s) are not present in the wasteHowever, this waste will not be re-analyzed for 2,4-Dinitrotoluene, Hexachlorobenzene, and Hexachlorobutadiene, and it is assumed that these constituents are present at the detection limit value (as identified above)..

- Based on a review of the analytical data provided by INEEL, this waste is considered a hazardous waste based on the presence of Trichloroethene as an F-listed constituent,and as a characteristic waste, which must be treatment to meet the land disposal restrictions.

- **Recommendation:**

If this waste will not be treated on-site, the waste acceptance criteria of possible off-site treatment facilities should also be considered.

INEEL V-3 Liquids, VOC Analysis

Constituents	Concentration mg/L	Applicable Regulatory Limit	Applicable RCRA Waste Code	LDR Treatment Standard for wastewater in mg/l	LDR Treatment Standard for non-wastewater in mg/kg	Comments
Acetone	U (0.015) J	Treatment standard limit if UHC	UHC	0.28	160	
Benzene	U (0.01) J	0.5 mg/l (D018) or treatment standard limit if UHC	D018 or UHC	0.14	10	
Bromodichloromethane	U (0.01) J	Treatment standard limit if UHC	UHC	0.35	15	
Bromoform (Tribromomethane)	U (0.01) J	Treatment standard limit if UHC	UHC	0.63	15	
Bromomethane	U (0.01) J	Treatment standard limit if UHC	UHC	0.11	15	
2-Butanone (MEK)	U (0.01) J	200 mg/l (D035) or treatment standard limit if UHC	D035 or UHC	0.28	36	
Carbon disulfide	U (0.01) J	Treatment standard limit if UHC	UHC	3.8	4.8 mg/l	
Carbon tetrachloride	U (0.01) J	Treatment standard limit if UHC	UHC	0.057	6	

U = Not Detected (Detection limit in parenthesis).
J = Estimated Value
R = Result rejected during validation and unusable.

INEEL V-3 Liquids, VOC Analysis

Constituents	Concentration mg/L	Applicable Regulatory Limit	Applicable RCRA Waste Code	LDR Treatment Standard for wastewater in mg/l	LDR Treatment Standard for non-wastewater in mg/kg	Comments
Chlorobenzene	U (0.01) J	100 mg/l (D021) or treatment standard limit if UHC	D021 or UHC	0.057	6	
Chloroethane	U (0.01) J	Treatment standard limit if UHC	UHC	0.27	6	
Chloroform	U (0.01) J	6 mg/l (D022) or treatment standard limit if UHC	D022 or UHC	0.046	6	
Chloromethane	0.01 R	Treatment standard limit if UHC	UHC	0.19	30	Since this value was rejected, it will have to be re-analyzed to determine concentration in the waste.
Dibromochloromethane (Chlorodibromomethane)	U (0.01) J	Treatment standard limit if UHC	UHC	0.057	15	
1,1-Dichloroethane	0.019 J	Treatment standard limit if UHC	UHC	0.059	6	
1,2-Dichloroethane	U (0.01) J	0.5 mg/l (D028), or treatment standard limit if UHC	D028 or UHC	0.21	6	

U = Not Detected (Detection limit in parenthesis).
J = Estimated Value
R = Result rejected during validation and unusable.

86 of 172

INEEL V-3 Liquids, VOC Analysis

Constituents	Concentration mg/L	Applicable Regulatory Limit	Applicable RCRA Waste Code	LDR Treatment Standard for wastewater in mg/l	LDR Treatment Standard for non-wastewater in mg/kg	Comments
1,1-Dichloroethene	U (0.01) J	0.7 mg/l (D029) or treatment standard limit if UHC	D029 or UHC	0.025	6	
1,2-Dichloroethene (total)	**0.2**	**Treatment standard limit if UHC**	**UHC**	**0.054**	**30**	**The 0.2 mg/L concentration exceeds the ww treatment standards and may be a UHC.**
1,2-Dichloropropane	U (0.01) J	Treatment standard limit if UHC	UHC	0.85	18	
cis-1,3-Dichloropropene	U (0.01) J	Treatment standard limit if UHC	UHC	0.036	18	
trans-1,3-Dichloropropene	U (0.01) J	Treatment standard limit if UHC	UHC	0.036	18	
Ethylbenzene	U (0.01) J	Treatment standard limit if UHC	UHC	0.057	10	
2-Hexanone (Methyl n-butyl ketone)	U (0.01) J	NA	NA	NA	NA	
4-Methyl-2-pentanone (MIK)	U (0.01) J	Treatment standard limit if UHC	UHC	0.14	33	
Methylene chloride	U (0.01) J	Treatment standard limit if UHC	UHC	0.089	30	

U = Not Detected (Detection limit in parenthesis).
J = Estimated Value
R = Result rejected during validation and unusable.

87 of 172

INEEL V-3 Liquids, VOC Analysis

Constituents	Concentration mg/L	Applicable Regulatory Limit	Applicable RCRA Waste Code	LDR Treatment Standard for wastewater in mg/l	LDR Treatment Standard for non-wastewater in mg/kg	Comments
Styrene	U (0.01) J	NA	NA	NA	NA	
1,1,2,2-Tetrachloroethane	U (0.01) J	Treatment standard limit if UHC	UHC	0.057	6	
Tetrachloroethene	U (0.01) J	0.7 mg/l (D039) or treatment standard limit if UHC	D039 or UHC	0.056	6	
Toluene	U (0.01) J	Treatment standard limit if UHC	UHC	0.08	10	
1,1,1-Trichloroethane	U (0.01) J	Treatment standard limit if UHC	UHC	0.054	6	
1,1,2-Trichloroethane	U (0.01) J	Treatment standard limit if UHC	UHC	0.054	6	
Trichloroethene	**0.2**	**None if listed**	**F001**	**0.054**	**6**	**0.2 mg/L is below the characteristic limit, but exceeds the wastewater treatment standard. Therefore it may be F-listed or a UHC.**
Vinyl chloride	0.011 J	0.2 mg/l (D043), orTreatment standard limit if UHC	D043 or UHC	0.27	6	
Xylene (ortho)	U (0.01) J	NA	NA	NA	NA	

U = Not Detected (Detection limit in parenthesis).
J = Estimated Value
R = Result rejected during validation and unusable.

98 of 172

INEEL V-3 Liquids, VOC Analysis

Constituents	Concentration mg/L	Applicable Regulatory Limit	Applicable RCRA Waste Code	LDR Treatment Standard for wastewater in mg/l	LDR Treatment Standard for non-wastewater in mg/kg	Comments
Xylene (total meta and para)	U (0.01) J	Treatment standard limit if UHC	UHC	0.32	30	

U = Not Detected (Detection limit in parenthesis).
J = Estimated Value
R = Result rejected during validation and unusable.